REMARKS/ARGUMENTS

Claims 1-7 and 12-18 are rejected under U.S.C 102(b) as being anticipated by Harkin et al. (US 5,705,413). Claims 10-11 and 21-22 are rejected under U.S.C 103(a) as being unpatentable over Harkin et al. (US 5,705,413) in view of Kawasaki et al. (US 6,426,245). In response to the Office action identified above, please accept the following remarks.

1. Claims 1-7 and 12-18 are rejected under 35 U.S.C 102(b) as being anticipated by Harkin et al. (U.S 5,705,413).

Harkin et al. teaches a method of forming a polysilicon film by an excimer laser crystallization process (Abstract). Harkin et al. shows providing a substrate (having a buffer layer) defined with a first region and a second region (Fig.1-2, col. 7, lines 1-25, col.10, lines 1-10). Harkin et al. discloses forming an amorphous silicon film on the substrate, forming a mask layer on the amorphous silicon film, performing a first photo-etching process to remove the mask layer on the first region (Fig. 3-5, 13-14, col. 5, lines 50-65 col. 6, lines 1-20, col. 7, lines 24-67, col. 12, lines 49-67, col. 13, lines 1-17). Harkin et al. teaches forming a heat-retaining capping layer covering the mask layer and the amorphous silicon film (Fig. 3-5, col. 7, lines 40-67).

Furthermore, Harkin et al. shows performing the excimer laser crystallization process to make the amorphous silicon film in the first region crystallize to a polysilicon film (Fig. 5, col. 6, lines 1-20, col. 8, lines 9-25). Harkin et al. discloses an etching process to remove the heat-retaining layer, the mask layer, and to etch the portions of the

amorphous film after forming the polysilicon film (Fig. 13-14, col. 4, lines 24-35, col. 9, lines 40-45, col.13, lines 1-17). Harkin et al. teaches the mask layer and the heat-retaining capping layer comprising silicon oxide, silicon nitride, silicon oxynitride or a metal (col. 3,4 lines 47-50, 63-67, col. 4, lines 1-4).

In addition, Harkin et al. describes the masking pattern (20,21) having a thermally-stable absorbent layer or reflective inorganic material and an insulating layer having sufficient thickness to mask the amorphous film. Therefore, Harkin et al. anticipated both recitations: forming a heat-retaining capping layer covering the mask and forming a mask layer on the heat-retaining capping layer (Abstract, col. 2, lines 58-67, col. 3, lines 1-5, col.3 lines 25-67, col. 4, lines 1-24). In addition, the elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Response:

Applicant intends to point out the difference between the claim 1 and 12 of the present application and prior art. Claims 1 and 12 of the present application are repeated in the following:

"Claim 1 (Original): A method of fabricating a polysilicon film by an excimer laser crystallization process, the method comprising following steps:

providing a substrate defined with a first region and a second region;

forming an amorphous silicon film on the substrate;

forming a mask layer on the amorphous silicon film;

performing a first photo-etching process to remove the mask layer in the first region;

forming a heat-retaining capping layer covering the mask layer and the amorphous silicon film; and

performing the excimer laser crystallization process to make the amorphous silicon film in the first region crystallize to a polysilicon film."

"Claim 12 (Original): A method of fabricating a polysilicon film by an excimer laser crystallization process, the method comprising following steps:

providing a substrate defined with a first region and a second region;

forming an amorphous silicon film on the substrate;

forming a heat-retaining capping layer on the amorphous silicon film;

forming a mask layer on the heat-retaining capping layer;

performing a first photo-etching process to remove the mask layer in the first region; and

performing the excimer laser crystallization process to make the amorphous silicon film in the first region crystallize to a polysilicon film."

As disclosed in the claim 1 of the present application, there are obvious differences between Harkin's disclosure and the present application. In the present application, a first photo-etching process is performed to remove the mask layer 116 in the first region to expose the amorphous silicon film 114 in the first region. Then, a chemical vapor deposition process is performed to form a heat-retaining capping layer covering on both the mask layer 116 in the second region and the

amorphous silicon film 114 in the first region (As shown in Fig.5). Alternatively, a heat-retaining capping layer 216 is first formed in both of the first and second regions and then a patterned mask layer 213 is formed to covering on the heat-retaining capping layer 216 in the second region (as disclosed in the claim 12 and Fig.8). And the excimer laser is used to make the amorphous silicon film in the first region crystallize to a polysilicon film. The heat-retaining capping layer 118 is used to reduce the heat dissipation rate in the crystallization process and maintain the amorphous silicon film 114 in a higher temperature environment for more time to perform the crystallization that leads to increase the grain size effectively (paragraph 0019, lines 7-12, paragraph 0023, lines 1-4). On the other words, *when performing the excimer laser crystallization process, the amorphous silicon film 114 is not directly exposed under the laser but is covered by the heat-retaining capping layer 118.*

According to Harkin's disclosure, a semiconductor film 1 is formed on an insulating substrate 10. Then a barrier insulating layer 20 and a masking pattern of thermally-stable absorbent or reflective inorganic material 21 is sequentially formed on the semiconductor film 1 (Fig. 3, 13, col. 6, lines 10-11, col. 7, lines 40-48, col. 12, lines 59-65). Before exposing the first portion 1a of the semiconductor film 1 to the energy beam, the barrier insulating layer 20'and the inorganic material 21' are removed from the first portion 1a of the semiconductor film 1 (Fig. 4-5, col. 6, lines 12-19, col. 7, lines 50-58, col. 12, lines 64-67, col. 13-14, lines 6-9). After that, the energy beam 25 is used to define the first and second portions 1a and 1b of different crystallinity (col. 6, lines 20-25, col.7, lines 61-63). It should be noted that the energy beam 25 directly exposes the un-masked first portion 1a of the semiconductor film 1 to

crystallize the material in the first portion 1a, while the masking pattern 21 is remained to mask the second portion 1b from the energy beam 25 (col. 5, lines 60-64). The diffusion barrier 20 is against adverse effects of heat diffusion or impurity diffusion from the masking pattern of inorganic material (col. 3 lines 47-62), and the inorganic masking pattern 21 is stable with this laser beam and reflects the laser beam 25 from over the film portions 1b which are not to be crystallized (col. 7; lines 63-67, col. 8, lines 35-40). Thus, absolutely, the Harkin's doesn't teach to use a heat-retaining capping layer to cover the amorphous film, which is predetermined to form a polysilicon film, for maintaining it in a higher temperature environment. *On the other words, the amorphous film predetermined to form a polysilicon film of the Harkin's disclosure is directly exposed on the energy beam, but that of the present invention is covered by the heat-retaining capping layer under the energy beam so as to increase the grain size of the polysilicon film and improve the performance of devices.*

From the above discussion, the Applicant believes that claims 1 and 12 of the present application are absolutely different from the Harkin's disclosure. Reconsideration of claims 1 and 12 is therefore requested. Claims 2-7 and 13-18 are dependent upon claim 1 and claim 12, and they should be allowed if claim 1 and claim 12 are allowed. Reconsideration of claims 2-7 and 13-18 is therefore requested.

2. **Claims 10-11 and 21-22 are rejected under 35 U.S.C 103(a) as being unpatentable over Harkin et al. (U.S. 5,705,413) in view of Kawasaki et al. (U.S 6,426,245).**

Regarding claims 10-11 and 21-22, Harkin et al. does not specifically show the long duration laser having a period in a range of about 150 to 250

ns. However, Kawasaki et al. teaches the excimer laser having a period form several nanoseconds through several hundred nanoseconds (col. 4, lines 58-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to specify any desired period on Harkin et al. reference as taught by Kawasaki et al. in order to optimize the laser conditions and better control the crystallizing growth (Kawasaki et al., col. 4, lines 58-67).

In addition, it is the examiner's position that the period in a range of about 150 to 250 ns it is not critical to the invention. Therefore, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response:

Claims 10-11 and 21-22 are dependent upon claim 1 and claim 12, and they should be allowed if claim 1 and claim 12 are allowed. Reconsideration of claims 10-11 and 21-22 is therefore requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Sincerely yours,

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